

Amendment to the Claims:

This listing of claims will replace all versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A method for managing a queue of packets using queue set data structures, the method comprising:

transforming a plurality of consecutive packets into a queue set data structure based on a target queue set data structure size, the plurality of consecutive packets being associated with the queue, wherein the plurality of consecutive packets comprises a first packet having a first packet size and a second packet having a second packet size; [[and]]

performing a queuing operation on the queue set data structure, the queuing operation treating the queue set data structure as a single entity, and the queuing operation being performed on each of the plurality of consecutive packets in the queue set data structure; and

determining whether transforming a third consecutive packet into the queue set data structure results in the sum of the packet sizes exceeding the target queue set data structure size;
and

responsive to determining the sum exceeds the target queue set data structure size:

closing the queue set data structure;

initiating a new queue set data structure; and

adjusting a target queue set data structure size allocated for the new queue set data structure based upon an amount the sum of the packet sizes exceeds the target queue set data structure size.

wherein performing the queuing operation further comprises shaping traffic flow of the queue set data structure at a rate for transmission of data from the queue.

2. (Previously Presented) The method of claim 1, wherein transforming the plurality of consecutive packets into the queue set data structure further comprises:

determining a size of each of the plurality of consecutive packets;

allocating the plurality of consecutive packets to the queue set data structure based on a target queue set data structure size according to the consecutive packet sizes, the target queue set data structure size being approximate to a largest supported packet length of the queue.

3. (Previously Presented) The method of claim 1, further comprising:
determining a queue service interval for performing queuing operations on queue sets data structures based upon a desired data rate and a target queue set data structure size;
wherein performing the queuing operation on the queue set data structure related to the queue further comprises:
performing a first queuing operation on a first queue set data structure related to the queue,
delaying a period of time equivalent to the queue service interval, and
performing a subsequent queuing operation on a second queue set structure related to the queue.

4. (Previously Presented) The method of claim 3, wherein determining the queue service interval further comprises:
determining an average queue set data structure size for the queue sets data structures over a period of time; and
adjusting the queue service interval based upon a difference between the average queue set data structure size and the target queue set data structure size.

5. (Canceled)

6. (Previously Presented) The method of claim 1, wherein the queuing operation comprises at least one selected from a group consisting of: enqueue operation and dequeue operation.

7. (Previously Presented) The method of claim 1, further comprising:
determining that each queue set data structure of a plurality of consecutive queue sets data structures is the same;

using one representative queue set data structure to represent the plurality of consecutive queue sets data structures, a replication count of the queue set data structure being equivalent to the number of queue sets data structures in the plurality of consecutive queue sets data structures; and

performing a queuing operation on the representative queue set data structure, and the queuing operation being performed on each of the plurality of consecutive queue sets data structures.

8. (Previously Presented) A system for queue management using queue sets data structures, comprising:

a queue set data structure generator configured for transforming a plurality of consecutive packets into a queue set data structure based on a target queue set data structure size, the plurality of consecutive packets being associated with a queue, wherein the plurality of consecutive packets comprise a first packet having a first packet size and a second packet having a second packet size, the queue set data structure generator further configured for generating a notification when a queue set data structure is ready for scheduling; and

a scheduler communicatively coupled to the queue set data structure generator to receive the notification, the scheduler configured for performing a queuing operation on the queue set data structure, the queuing operation treating the queue set structure as a single entity, and the queuing operation being performed on each of the plurality of consecutive packets in the queue set data structure;

wherein the scheduler is further configured for determining a queue service interval for performing queuing operations on queue sets data structures based upon a desired data rate and a target queue set data structure size, performing a first queuing operation on a first queue set data structure related to the queue, delaying a period of time equivalent to the queue service interval, and performing a subsequent queuing operation on a second queue set data structure related to the queue; and

wherein the scheduler is further configured for determining an average queue set data structure size for the queue sets data structures over a period of time, and adjusting the queue service interval based upon a difference between the average queue set data structure size and the target queue set data structure size.

9. (Previously Presented) The system of claim 8, wherein the queue set data structure generator is further configured for:

determining a size of each of the plurality of consecutive packets; and

allocating the plurality of consecutive packets to the queue set data structure based on a target queue set data structure size according to the consecutive packet sizes, the target queue set data structure size being approximate to a largest supported packet length of the queue.

Claims 10 - 11 (Canceled)

12. (Previously Presented) The system of claim 8, wherein the scheduler is further configured for shaping traffic flow of the queue set data structure at a rate for transmission of data from the queue.

13. (Previously Presented) The system of claim 8, wherein the queuing operation comprises at least one selected from a group consisting of: enqueue operation and dequeue operation.

14. (Previously Presented) The system of claim 8, wherein the queue set data structure generator is further configured for determining that each queue set data structure of a plurality of consecutive queue sets data structures is the same, and using one representative queue set data structure to represent the plurality of consecutive queue sets data structures, a replication count of the queue set data structure being equivalent to the number of queue sets data structures in the plurality of consecutive queue sets data structures, and wherein the scheduler is further configured for performing a queuing operation on the representative queue set data structure, and the queuing operation being performed on each of the plurality of consecutive queue sets.

15. (Previously Presented) The method of claim 1, wherein at least one of the plurality of consecutive packets is a multicast packet, further comprising:

determining a number of times the multicast packet is to be replicated;

determining a first number of copies, the first number of copies representing how many copies of the multicast packet can be processed by a first queue;

inserting data into the queue set data structure indicating the multicast packet is to be replicated the first number of times in the first queue;

determining a remaining number of times the multicast packet is to be replicated; and

generating a second queue set data structure for a second queue, the second queue set data structure comprising a number of times the packet is to be replicated within the second queue set data structure and a number of times the second queue set data structure is to be replicated;

wherein a product of the number of times the packet is to be replicated within the second queue set data structure and the number of times the second queue set data structure is to be replicated is not greater than the remaining number of times the multicast packet is to be replicated.

16. (Canceled)

17. (Previously Presented) The method of claim 1, further comprising adjusting a target queue set data structure size allocated for a next queue set data structure so that the average of the queue sets is approximately target queue set size.

18. (Previously Presented) The method of claim 1, the performing a queuing operation on the queue set data structure further comprises:

determining a first replication count for the first packet;

determining a second replication count for the first packet;

replicating the first packet corresponding to the first replication count; and

replicating the second packet corresponding to the second replication count;

wherein one of a group consisting of the first replication count and second replication

19. (Previously Presented) A method for managing a queue of packets using queue set data structures, the method comprising:

transforming a plurality of consecutive packets into a queue set data structure based on a target queue set data structure size, the plurality of consecutive packets being associated with the queue, wherein the plurality of consecutive packets comprises a first packet having a first packet size and a second packet having a second packet size;

performing a queuing operation on the queue set data structure, the queuing operation treating the queue set data structure as a single entity, and the queuing operation being performed on each of the plurality of consecutive packets in the queue set data structure; and

adjusting a target queue set data structure size allocated for a next queue set data structure so that the average of the queue sets is approximately target queue set size.

20. (Previously Presented) The method of claim 19, wherein at least one of the plurality of consecutive packets is a multicast packet, further comprising:

determining a number of times the multicast packet is to be replicated;

determining a first number of copies, the first number of copies representing how many copies of the multicast packet can be processed by a first queue;

inserting data into the queue set data structure indicating the multicast packet is to be replicated the first number of times in the first queue;

determining a remaining number of times the multicast packet is to be replicated; and

generating a second queue set data structure for a second queue, the second queue set data structure comprising a number of times the packet is to be replicated within the second queue set data structure and a number of times the second queue set data structure is to be replicated;

wherein a product of the number of times the packet is to be replicated within the second queue set data structure and the number of times the second queue set data structure is to be replicated is not greater than the remaining number of times the multicast packet is to be replicated.